Multicentric Gliomas of the Cerebral and Cerebellar Hemispheres*

Case Report

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Among the many published accounts of multiple primary brain tumors are reports not only of multiple gliomas but also of diverse lesions, such as combinations of gliomas with meningiomas, or with pituitary neoplasms. Multiple primary gliomas are not rare; indeed, Courville felt that almost 9% of all gliomas were multiple. More recent authors have felt this estimate to be excessively high, but nevertheless place the incidence at about 2.5%.

On rare occasion these multicentric tumors occur in both the cerebrum and cerebellum in the same individual. We are reporting our experience with this unusual association in one of our patients.

Case Report

This 32-year-old right-handed white woman was first seen in the Neurology Clinic in January, 1958, with a history of two grand mal and three minor motor seizures in the preceding 2 years; she had been placed on anticonvulsants after electroencephalography (EEG) showed paroxysmal left-sided slow wave activity. General and neurologic examinations were normal. The EEG still showed diffuse slow waves on the left, and left temporal spiking.

The seizures persisted despite anticonvulsant therapy. The neurological examinations otherwise remained entirely normal over the next 6 years. Repeated EEG's revealed only a slightly greater involvement in the left frontal area in April, 1964, as compared to 1958.

In July, 1965, the patient noted the onset of difficulty with her speech, principally in the expressive sphere, and impairment of memory for recent events. Intermittent seizure activity had persisted and was mainly of a right-sided clonic type, with speech involvement. There was no paresis. She began to experience headaches and 1 week later in October, 1965, was readmitted to the clinic.

Examination. There was mild papilledema and mild-to-moderate expressive dysphasia, without anoma. X-ray films of the chest were normal, but those of the skull revealed multiple left frontal calcification (Fig. 1). Carotid angiography confirmed the presence of a mass and indicated almost total involvement of the left frontal lobe.

Operation. A left frontal craniotomy was performed on November 8, 1965, and a neoplasm visualized through the intact leptomeninges. It was described as "whitish in some areas and purplish and more vascular in others. In the depths of the tumor, certain areas were white or yellow and hard, others were soft and necrotic." Two small cysts were encountered. The tumor involved almost the entire frontal lobe, and was noted to be infiltrating posteriorly into the parietal lobe. A subtotal resection involving the bulk of the frontal lobe anterior to the motor cortex was performed. The pathologic diagnosis was that of a mixed tumor (oligodendroglcoma and astrocytoma) of the cerebrum and a meningioma of the adjacent dura.

Postoperative Course. Recovery was uneventful, and speech was improved. The patient received a course of cobalt-60 radiation, with a tumor dose of 6236 R.

In February, 1966, she complained of mild speech difficulties and of occasional diplopia. Convulsions recurred in April, 1966, when she forgot to take her anticonvulsant medications. In May, 1968, she developed headaches, nausea, vomiting, diplo-

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sluggish, yet she moved her extremities spontaneously, the right side better than the left. On the 10th postoperative day, total angiography demonstrated only the residual left-sided tumor; the posterior circulation showed no recognizable abnormalities. Lumbar puncture revealed only clear fluid. Her level of awareness improved over the next 9 days, but on the 19th postoperative day she again became unresponsive. Lumbar puncture again showed no evidence of bleeding. The patient's neurological status did not change, and she died on the 23rd postoperative day.

**Autopsy Findings.** The significant findings were limited to the brain. The cerebral hemispheres were asymmetrical due to the operative loss of tissue from the left frontal lobe involving the cingulate, superior, middle, and inferior frontal gyri. The rostro-caudal extent of this defect (at the cortical surface) was 5 cm, and its dimension over the convexity 9 cm. There was a small amount of fresh operative hemorrhage in the walls of this somewhat irregular and very deep surgical defect. The left lateral ventricle was widely exposed through the surgical defect. There was no significant accumulation of subarachnoid blood and no tumor or exudate present in the leptomeninges. There was a small left uncal hernia and bulging of the floor of the third ventricle. The mammillary bodies were small, the right one flattened and approximately half the normal size. The left mammillary body was shifted into the midline. The hippocampal gyri were not herniated. The cerebellar tonsils were herniated and necrotic in their tips. There was a relatively small left cingulate gyrus hernia. The vessels of the circle of Willis were virtually free of atherosclerosis, anomalies, asymmetries, and aneurysms.

The cerebellar hemispheres were asymmetrical, with the right larger than the left. There was marked broadening, flattening, and softening of the folia of the right biventer and ansiform lobule, which had a slight yellowish discoloration (Fig. 2). The superficial cerebellar vessels were moderately prominent over the left cerebellar hemisphere while over those portions of the right cerebellar hemisphere involved in the obvious folial expansion they were almost blood-free.